



Developed on Johnston Island (main picture), the gimbal cam socket (inset) effortlessly unthreads the fuse adapter of 155mm and 8-inch chemical projectiles.

Innovation Clears Path for Chemical Weapons

LOCATED in the Pacific Ocean 845 miles southwest of Hawaii, the Johnston Atoll Chemical Agent Disposal System is a fully integrated chemical weapons disposal facility. Over the past 10 years, more than 407,000 munitions and 2,005 tons of chemical agent have been destroyed there.

Army engineers encountered a roadblock, however, during the destruction of some 42,000 projectile casings containing nerve agent. During the processing of GB (sarin) 155mm projectiles, JACADS' automatic equipment could not remove the fuse adapter on some of the munitions.

To avoid processing more than 6,000 munitions individually, the engineers decided to

modify the disassembly machine. The result was the gimbal cam socket, a direct replacement assembly for the hydraulic chuck.

The gimbal cam socket effortlessly unthreads the fuse adapter of 155 mm and 8-inch projectiles, an operation critical to disassembling the munitions into separate parts for disposal.

The invention "is responsible for helping us beat the baseline incineration schedule by 17 days," said Gary McCloskey, JACADS project manager.

The socket provides the solution to the exacting requirements of the automated disassembly machinery. Similar to the rubber pad used to twist lids off stubborn jars, it uses grip and pressure to fit every projectile, whether or not it is positioned exactly within the automated disassembly machinery.

Full-scale testing demonstrated that the socket simplified the unthreading operation, reduced cycle time, lessened maintenance time and nearly eliminated munition rejects.

As of November, JACADS had successfully completed destruction of 98.7 percent of its original chemical weapons stockpile, totaling approximately 4.01 million pounds of chemical agent, all of it located on Johnston Island. The Army is currently working with several federal agencies to plan the closure of the facility.

"This is the Army's highest achievement in the chemical-stockpile disposal project yet — the closure of its first chemical-weapons disposal facility," McCloskey said.

Because of its success, the

Schofield Barracks has been aggressive in removing cleaning solvent contamination from its underground water supply.

gimbal cam socket will be used at other chemical agent disposal facilities. — *Program Manager for Chemical Demilitarization*

Schofield Barracks Off Superfund List

THE Environmental Protection Agency has deleted Schofield Barracks, Hawaii, from the National Priorities List for Superfund cleanup sites. The deletion marks the first time an entire Army installation has been deleted from the nationwide list.

Schofield Barracks is only the 10th federal facility deleted from the NPL since the Superfund was established in 1980. The list identifies sites that appear to present a risk to public health and welfare or to the environment.

Schofield Barracks was placed on the list in 1990 due to the presence of trichloroethylene, a common cleaning solvent, in the underground water body the post uses as its drinking-water source.

Schofield Barracks stopped using the wells when TCE was discovered in 1985, and the Army immediately sought ways



to remove the contaminant.

In September 1986 the Army built an air-stripping facility to remove the TCE from its drinking water. As another part of the clean-up remedy, the Army improved the cover over a 40-acre landfill and implemented a maintenance and groundwater-monitoring program for the site.

"The EPA and the Hawaii Department of Health have determined that the remedial action has been successfully executed and that the site poses no significant threat to public health or the environment," said Jon Fukuda, installation restoration program manager with the U.S. Army, Hawaii, Directorate of Public Works.

Cooperation among EPA, the Hawaii Department of Health and the Army made a rapid, cost-effective resolution possible, said James Daniel of the U.S. Army Environmental Center, who was project manager for the Schofield Barracks program and later oversaw the corrective action for USAEC's Environmental Restoration Branch. USAEC also provided geological and chemical expertise for the project, demonstrat-

ing to EPA, through groundwater flow modeling, that the TCE is contained.

Superfund, established in December 1980 by the Comprehensive Environmental Response, Compensation and Liability Act, gives broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. It takes its name from a trust fund used to clean up sites when no responsible party can be identified. — *Neal Snyder, U.S. Army Environmental Center*

Vinyl is Thrifty Alternative to Steel

SINCE the U.S. Army Corps of Engineers first drove sheet piling, steel has been the material of choice. Now the New Orleans District has pioneered the use of vinyl sheet piling to replace steel in applications such as seepage cutoff walls.

John Bivona, chief of NOD's cost-engineering branch, said that the money-saving uses of the vinyl sheet pilings might still

be unknown if not for the insight of Wade Wright, a civil-engineering technician. Wright came up with the idea in late 1997 as he searched for an alternative to cold-rolled steel, which tended to allow seepage.

One reason vinyl is a good alternative to steel is because it features an I-beam locking system that resists separation once placed in the ground and provides a tighter seal against water seepage.

Vinyl sheet piling has at least three cost-saving benefits, Bivona said: It's much less expensive per square foot than steel sheet piling; it's lighter than steel, which means lower transportation costs and savings on heavy-lifting equipment; and installation equipment for vinyl piling is lighter and less expensive.

By using vinyl sheet on five recent projects, NOD's engineering division has realized an accumulated savings of about \$100,000, Bivona said. "This amount may seem small, but it represents a significant beginning, since the majority of

flood control projects require seepage cutoffs," he said.

The vinyl sheet pilings are made of modified polyvinyl chloride, a plastic that can be placed in the same environments as steel, said Peter Manning of Materials International in Atlanta, the company that won the bid on the first NOD project using vinyl sheets. And vinyl, unlike steel, does not corrode when exposed to the elements, he said.

Yet, vinyl is not expected to replace steel completely. Its biggest disadvantage is that it can't be used in applications that require an ability to withstand extreme weight, Wright said.

The future of vinyl sheet piling in Corps projects depends on using it selectively. Bivona said about a dozen new Southeast Louisiana seepage projects will use vinyl sheet pilings, and that further applications are being explored. These include floodwall, slope stabilization and channel lining projects. — *Maurice Ruffin, USACE New Orleans District Public Affairs Office*

ORDER EARTH DAY 2001 POSTERS NOW

EARTH DAY is being celebrated this year on April 22. Our theme for Earth Day 2001 is **"Transforming the Army... Sustaining the Environment."**

Now is the time to plan for Army Earth Day.

As it does every year, the U.S. Army Environmental Center will provide information and planning materials for your installation's local Earth Day activities. Go to USAEC's Web site at <http://aec.army.mil> for ideas, resources and order forms for this year's Army Earth Day poster. Or contact Ms. Deborah Elliott by phone at (410) 436-1272, (DSN) 584-1272 or by e-mail at Deborah.Elliott@aec.apgea.army.mil.

ARMY * EARTH * DAY * 2001



Please send your contributions or questions to Cynthia Houston, National Outreach Team Leader, U.S. Army Environmental Center, 5179 Hoadley Road, Attn.: SFIM-AEC-PA, Bldg. 4415, Aberdeen Proving Ground, MD 21010-5401, or e-mail Environmental.Front@aec.apgea.army.mil. Houston may be reached by phone at (410) 436-1270 or (DSN) 584-1270.